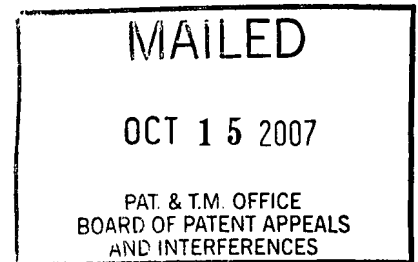


1 RECORD OF ORAL HEARING  
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3 UNITED STATES PATENT AND TRADEMARK OFFICE  
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5  
6 BEFORE THE BOARD OF PATENT APPEALS  
7 AND INTERFERENCES  
8

9  
10 Ex parte HYEON JUN KIM and JI EUN LEE  
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12  
13 Appeal 2007-2513  
14 Application 09/785,443  
15 Technology Center 2600  
16



17  
18 Oral Hearing Held: September 12, 2007  
19  
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21  
22 Before JOSEPH F. RUGGIERO, ANITA PELLMAN GROSS, and  
23 ST. JOHN COURTENAY III, *Administrative Patent Judges*.  
24

25 ON BEHALF OF THE APPELLANTS:  
26

27 CAROL L. DRUZBICK, ESQUIRE  
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32 The above-entitled matter came on for hearing on Wednesday,  
33 September 12, 2007, commencing at 9:30 a.m., at the U.S. Patent and  
34 Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Laurel P.  
35 Platt, Notary Public.

1 THE CLERK: Appeal number 2007-2513, Attorney Carol Druzbeck.

2 JUDGE RUGGIERO: Good morning.

3 MS. DRUZBICK: Good morning. Shall I go ahead?

4 JUDGE RUGGIERO: You may begin whenever you like.

5 MS. DRUZBICK: I am here for application serial number  
6 09/785,443.

7 Essentially this case is directed to a content-based retrieval system and  
8 method that uses color histograms.

9 Basically you have a query image, and you are searching for similar --  
10 a query image with a corresponding histogram that describes this, and you  
11 are searching for a similar image which also has a histogram.

12 A feature of this invention is that it converts -- in order to compare the  
13 histogram, the query histogram with the search histogram, it converts the  
14 histogram based on color space and color quantization method in order to  
15 compare them.

16 In the related art or the conventional art, you can only compare color  
17 histograms from different systems when the color space and the color  
18 quantization method were the same.

19 But the invention disclosed in the present application can convert -- it  
20 either converts the query image histogram or the histogram of the image to  
21 be retrieved into a histogram having a color space and color quantization  
22 measure of the other. This allows them to be compared.

23 It not only converts the color space, but what it does is it maps the  
24 subspaces of one color space into the quanti bins or a subspace of the other.  
25 And sometimes those overlap. It does that by mapping or projecting a  
26 volumetric ratio of a portion of the color space into the other color space,

1 either directly or by sampling.

2 Now, just to give a little background on a histogram and how you  
3 create a histogram, basically you pick a color space, and there are a bunch of  
4 different color spaces. One is called RGB, which stands for red, green, blue.  
5 And one is HSV, which stands for hue, saturation value. And there are  
6 several other ones.

7 So you pick a color space. Basically it's a three-dimensional color  
8 graph, which is a three-dimensional shape. Then you quantize that color  
9 space to create the histogram.

10 What you are doing is basically dividing the color space into  
11 subspaces or bins, and then you classify the pixels in the image. You  
12 basically assign them a value into that color space using an algorithm. And  
13 then you count the number of pixels in each bin.

14 You count the number of pixels in each bin, and then you categorize  
15 them into the bins. And then what they usually do is normalize the value,  
16 take the number of pixels in each bin and divide it by the total number of  
17 pixels in the image. And then you assign a binary value to each bin.

18 This is a way to describe basically color distribution in the image  
19 using descriptive information.

20 So basically what ours does is it does this histogram conversion which  
21 allows you to do a similarity between histograms.

22 Now, the rejection in the final office action dated July 13, 2004,  
23 rejected most of the claims over the referenced Bergman. So I'll basically --  
24 and then one Claim 12 over Bergman. I will basically be talking about  
25 Bergman.

26 Now, it's applicant's contention that Bergman does not disclose this

1 conversion of the histogram based on both color space and color  
2 quantization method.

3 JUDGE GROSS: Where is the language based on? The claim 1.

4 MS. DRUZBICK: Sure. Claim 1 has a histogram converter which  
5 converts the color histogram of one of the extracted query multimedia data  
6 and the multimedia data to be retrieved into a histogram having a color space  
7 and color quantization method of the other.

8 So basically you're taking either your query histogram or your  
9 histogram of the image to be retrieved, and you are converting them so that  
10 they have the same color space and quantization method.

11 JUDGE GROSS: Okay. But let's say we are converting from the  
12 query to the other, just so that we don't have to keep seeing either this or  
13 this.

14 MS. DRUZBICK: Okay.

15 JUDGE GROSS: If you start with RGB 512, so there's your color  
16 histogram for the query.

17 MS. DRUZBICK: Yes.

18 JUDGE GROSS: And you want to convert to -- what was the other  
19 one? -- HVS 512.

20 MS. DRUZBICK: Yes.

21 JUDGE GROSS: You are converting one histogram that has a color  
22 space and a color quantization method to another histogram which has a  
23 different color space. It has the same color quantization method, but it is a  
24 different histogram because one of the things is different. How does your  
25 claim require that both things be different?

26 MS. DRUZBICK: I think it does -- I think in the word the conversion

1 -- converts. It converts the histogram and converts -- it would be changed,  
2 and so you're changing --

3 JUDGE GROSS: The histogram is different; the color space is  
4 different. Correct?

5 MS. DRUZBICK: It says it converts into a histogram having a color  
6 space and color quantization method of the other, so it would require both of  
7 the other.

8 If you note, in some of the later claims saying that they're different  
9 from each other.

10 JUDGE GROSS: I agree that Claim 13, for example, does require  
11 that both be different. It specifies when the color spaces and the color  
12 quantization methods are different. I don't disagree. But I don't see in Claim  
13 1 that it requires that both be different.

14 Claim 1 just says it converts one histogram that has two things into a  
15 color histogram that has two things, so that after the conversion is done, the  
16 two things are the same. But I don't see that it requires they start out with  
17 both being different. At least one has to be different or there's no  
18 conversion.

19 But I don't see in the claim that it requires both be different until you  
20 get to, like I said, Claim 13.

21 MS. DRUZBICK: I would agree that 13 is more explicit. But with  
22 this conversion -- I mean it says we are converting having both -- to the  
23 other one having both, meaning having a color space and quantization of the  
24 other. So I would say that, you know, into a histogram having a color space  
25 of the other and quantization method of the other.

26 JUDGE GROSS: Well, let's not harp on this. Continue.

1 MS. DRUZBICK: So basically I think you pretty much understand  
2 what our position is. Our position is that Bergman teaches that you --  
3 basically it's defining a relationship between one description type and  
4 another standard description type, and they have to be derivatives.

5 I think it's very clear from Bergman that they have to be derivatives.  
6 He doesn't address color quantization method whatsoever. He explicitly  
7 states that they have to be derivatives. While he says the search engine 1902  
8 must transform the query histogram hue into an appropriate histogram color  
9 space, he doesn't address color quantization method.

10 And it's clear from the example that he gives that the quantization  
11 method is the same and the color space has to be a derivative.

12 Ours, on the other hand, is capable of converting based on both color  
13 space and color quantization method.

14 We've already talked about Claim 1.

15 Claim 6 has a method that has a similar step of converting, converting  
16 a color histogram of one of the input query multimedia data and the  
17 multimedia data to be retrieved into a color histogram having a color space  
18 and color quantization of the other -- of the other of the input query  
19 multimedia data and the multimedia data to be retrieved so as to be the same  
20 as each other.

21 Claim 13 is a method with a converting step. As we previously  
22 discussed, it says that when the color space and color quantization method of  
23 extracting multimedia data and the multimedia data to be retrieved are  
24 different from each other.

25 Claim 17 is also a method with a converting step converting the color  
26 histogram when the color space and color quantization method of the query

1 multimedia data and the color space and color quantization method of the  
2 multimedia to be retrieved are different.

3       Going to Claim 28, this is a system claim which has a description  
4 means for describing color space and color quantization method of an  
5 extracted color histogram. And along with the first color quantizer, a second  
6 color quantizer which extracts a color histogram of query multimedia data  
7 using a method which is the same as the described color space and color  
8 quantization method in order to perform the multimedia data retrieval.

9       And then Claim 13 is a method with a judging step which judges  
10 whether a color histogram of query multimedia data corresponding to a color  
11 space and quantization method of multidata to be retrieved is stored in  
12 advance and then calculating the similarity.

13       JUDGE GROSS: Let me ask you a question. Claim 32, where it talks  
14 about stored in advance before. Before what? Judging whether a histogram  
15 is stored in advance before and then there's a semicolon. Generally before  
16 has something following it.

17       MS. DRUZBICK: I think that that might be advances before -- an  
18 error. I think it's an error. But I will have to go back and check with my  
19 client on that.

20       JUDGE GROSS: Okay. Same as Claim 33.

21       MS. DRUZBICK: 33 also.

22       JUDGE GROSS: And 29.

23       MS. DRUZBICK: That I think may be a translation error.

24       JUDGE GROSS: Just so you know.

25       MS. DRUZBICK: Thank you.

26       JUDGE COURTENAY: The specification you broadly disclose is a

1 system for retrieving multimedia data. Can you elaborate on that, expand on  
2 that, what actual application there is. Are you matching images according to  
3 their color histogram or images within images? And is it not possible to  
4 have two different images that might have the same color distribution or  
5 have the same color histogram even though they're different images?

6 MS. DRUZHICK: Yes. Yes. That's one of the drawbacks of  
7 histograms, is that they only do color distribution and not kind of spatial  
8 color -- spatial distribution. And so yes, but in --

9 JUDGE COURTENAY: I guess I'm asking for some additional  
10 insight as to the actual application. You broadly disclosed it.

11 MS. DRUZHICK: I think actual application is basically searching for  
12 image with a similar histogram.

13 JUDGE COURTENAY: And not so much trying to match a  
14 particular object according to the color histogram.

15 MS. DRUZHICK: I think that histograms are limited in their ability  
16 to do that.

17 JUDGE COURTENAY: Okay.

18 MS. DRUZHICK: There are a lot of further descriptive meanings that  
19 do spatial information that would give you that.

20 JUDGE COURTENAY: But this application is actually comparing  
21 images per se?

22 MS. DRUZHICK: It is comparing images per se, but it's comparing  
23 histograms.

24 JUDGE GROSS: So this would be the first step in trying to find a  
25 matching image?

26



1 MS. DRUZHICK: Yes or one. One of the information they used. So  
2 yes, it would probably be a step process.

3 Any further questions?

4 JUDGE RUGGIERO: Thank you.

5 MS. DRUZHICK: Thank you very much.

6 (Whereupon, the proceedings at 9:50 a.m. were concluded.)

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